

Cell Biology

POST-CRYOGENIC BIOCHEMICAL COMPARISON OF SPERMATOZOA MEMBRANES ISOLATED FROM BLUE FOX AND SILVER FOX. Crystal L. Cornett¹, Dr. Wenche Farstad², and Dr. Robert R. Miller, Jr.^{*1}, 1) Hillsdale College, Biology Dept., Hillsdale, MI 49242, email:bob.miller@hillsdale.edu. 2) The Norwegian School of Veterinary Science, Dept. of Reproduction and Forensic Medicine, POB 8146, Oslo, Norway.

Wildlife parks and zoos have turned to assisted reproduction techniques, such as artificial insemination and *in vitro* fertilization, to save endangered animals. However, artificial insemination and *in vitro* fertilization techniques are dependent upon the ability to successfully cryogenically freeze spermatozoa and produce viable and motile spermatozoa upon thawing. Cryogenic protocols have been developed that are successful in storing spermatozoa collected from the silver fox (*Vulpes vulpes*). However these same protocols and modifications of these protocols have failed to preserve spermatozoa collected from the endangered blue fox (*Alopex lagopus*). Differences in the cryogenic behavior of spermatozoa may be related to differences in membrane fluidity.

Spermatozoa that can be cryogenically preserved may have more fluid membranes, facilitating the removal of water prior to cryogenic freezing. However, spermatozoa that cannot be cryogenically frozen may have less fluid membranes which impairs dehydration and facilitates ice-crystal damage during the cryogenic process. Since membrane fluidity is determined by the fatty acid and steroid composition of membranes, we have subjected isolated spermatozoa membranes from blue fox and silver fox to biochemical analyses. Silver fox spermatozoa membranes have significantly higher levels of docosapentaenoic acid (22:5, n-3), higher levels of membrane desmosterol, and higher levels of membrane cholesterol as compared to blue fox spermatozoa. Blue fox spermatozoa membranes have significantly higher levels of linoleic acid (18:3, n-3) as compared to silver fox spermatozoa.